UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
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TELEPHONE ENGINEERING INFORMATION

These information letters are intended to provide a means for answering questions that arise in the field and to inform the field of new developments. They are not intended to be instructions nor to replace in any respect the approved channels for establishing requirements and procedures.

New E-6 Negative Resistance VF Repeater. This repeater, made by the Transcom Electronics Company of Providence, Rhode Island, has been laboratory tested by REA transmission engineers. It meets all DDD transmission requirements, and arrangements are being made for field trial on an REA project.

Fuseless Station Protectors. Carbon composition of the arrester units of the Reliable 210 and R123 fuseless station protectors have been changed to improve surge life, and, therefore, consideration is being given to restoring these protectors to the list of acceptable materials. Progress reports on the field trials of the Cook 500 type fuseless station protector indicate favorable performance to date.

AEI Type 16B Gas Tube Protectors. Field trials of this protector have been completed and the results indicate that they have made great improvement in service continuity and reduction in equipment damage. One 16-B and two filter units were damaged during this field trial as a result of a direct power contact with a 14.4 kv conductor. However, the 16-B is not intended to protect against power fault currents. A second field trial of this type of protector has also indicated satisfactory performance. There is still no domestic manufacturer of the 16B protector.

Telephone Amplifiers. Field trials of Orbit PA239A transmitter amplifiers were satisfactorily completed in October 1964 in Georgia and Mississippi. Further evaluation and formulation of proposed application guidelines is in progress. General use of amplifiers as a system design tool is not approved at this time, but tentative application guideline information can be made available by REA for additional field trials on specific request.

Surge Burn-Down Tests of Open Wire Conductors. As a result of conductor failures from lightning on an REA project in Arizona, surge burn-down tests were conducted at the Bureau of Standards on open wire conductor. The results of this test have provided us with quantitative comparison data which will enable us to predict the performances of open wire facilities under a specific lightning surge incident. Until such time as TE & CM sections can be issued to reflect these test results, the REA staff will provide recommendations on an individual project basis if experience indicated lightning burn-down problems exist.

Lightning Damage to Load Coils. Data available in REA does not support field engineers reports made during the Interim Field Conference of extensive lightning damage to load coils. In order for us to accumulate the necessary experience data, we request field engineers to report all instances of lightning damage to load coils which come to your attention during the 1965 lightning season. The reports should state make, type, and quantity of damaged coils, nature of damage, and the type and gauge of the wire or cable facilities on which they were installed.

Cable Carrier. Superior has delayed its field tests of cable subscriber carrier equipment until this spring. It is presently planning to market this equipment sometime in the fall. Budleman also plans to market cable subscriber carrier with no announced schedule as to its availability.

Certain Bell companies are making extensive plans for borrowers to use its new Western Electric N-3 carrier equipment. This equipment is still under field trial in the Bell System and also will require field trial in REA system before it can be placed on the list of acceptable materials. If you have knowledge of a borrower proposing to use the N-3 carrier, please remind them of our field trial requirements (REA Bulletin 345-45).

IMTS. Certain milestones in IMTS were reached during the year 1964. (1) FCC recognized the IMTS concept by licensing it on a regular basis and presently looks favorably upon applications for more than one-channel where justified. (2) At least four borrowers have IMTS in service with one project in Exeter, California, well into its second year of operation. (3) The Bell System has completed its IMTS field trial in Harrisburg, Pennsylvania and has replaced this trial equipment with a new two-channel system. Bell has also installed a two-channel system in Charleston, West Virginia and a three-channel system in Salt Lake City, Utah. For REA borrowers, IMTS equipment is still in a field trial status. At present, General Electric and Motorola are the only suppliers of IMTS equipment.

REA specifications for mobile and fixed radiotelephone equipment (REA Form 397e) will be issued within the next three month period, to be shortly followed by an application guide (TE & CM 943).

Fiberglas Pedestals. Fiberglas buried plant terminal housings have been approved for use on REA borrowers' systems. They have particular application in corrosive atmospheres but are not limited thereto. They are

available in green and orange colors with galvanized or stainless steel stakes. They will withstand the heat of a grass fire but will ignite upon exposure to a prolonged flame. Pellets from a shotgun fired from a distance of 20 feet will not penetrate the housings. As in the case of existing pedestals, these Fiberglas housings are not bullet proof.

High Density Polyethylene Jacketed Cable. More borrowers are requiring the use of this type of insulated cable on their systems because it has stronger physical characteristics and is more resistant to abrasion than the low density type. High density polyethylene is more expensive but this may be offset by a 12 to 20 percent reduction in the thickness of the outer jacket depending upon the size of cable used. PE-23 makes provision for the use of high density polyethylene jackets when so specified which should always be done where rocky soil conditions exist.

Figure 8 Distribution Wire Clamps. A performance specification, PE-48, has been approved by REA which require that these new clamps hold the torsion created by spiraling the distribution wire. Spiral migration and damages have resulted when a support clamp allows the distribution support wire to turn in the clamp. REA will list these new clamps in lieu of the older type. An addendum to REA TE & CM 620 will soon be issued describing their application.

New Buried Distribution Wire. A new design of buried distribution wire containing one, two, or three pairs is in the last stage of development. Its design makes it suitable also for use as a buried service wire in one or two pair sizes. This wire is presently undergoing field trial and should be available for general use in the near future. The design consists of individually insulated conductors twisted into pairs or stranded into a star-quad configuration as an alternate design for the two-pair wire. An inner jacket is extruded over the conductor with a small bronze shield applied longitudinally over the inner jacket and sealed at the seam. An outer jacket of the high density polyethylene is extruded over the shield in such a manner as to bond to the shield. This new design should provide improved electrical and physical characteristics; make possible a direct splice into the cable pairs; and be more resistant to gopher damage.

Plastic Underground Ducts. Field trial of two inch ID medium high density polyethylene duct, buried simultaneously with 150 pair - 24 gauge cable, is being conducted on an REA project at Yadkinville, North Carolina. This duct, provided in 1000 foot reel lengths, costs about 14 cents per foot. A 50 pair - 24 gauge cable was pulled through a continuous 2000 foot length duct with relative ease. The results of this field test are favorable to date and REA recommendations concerning the use of plastic ducts will be set forth in the revision of TE & CM Section 643.

A field trial of 3 inch, four-way plastic duct system to be installed in a conventional manner with manholes, is also planned at Yadkinville.

Longer lengths, narrower trenches and lighter weight of plastic ducts should result in a reduction in installation costs when compared with conventional conduit systems. Polyethylene offers approximately one-half of the coefficient of friction as conventional duct material and will permit longer distances between manholes as well as a higher duct fill factor.

TOM Section 1361, Devices for Working Aloft. This section was issued in the interest of safety and to illustrate numerous proven methods designed to simplify the problems and to reduce the setting up and tearing down time when using ladders or platforms on aerial cable. It was published in a national trade magazine and from the requests for copies outside REA, the section was well received by the industry.

Revision PE-19. PE-19, REA Specification for Polyethylene-Insulated Bridle Wire, has been revised to require the use of high density polyethylene insulation on conductors of bridle wire. This new requirement will be effective for all bridle wire supplied, bid, or orders placed by REA borrowers after June 1, 1965. Also, this specification is being issued for the first time in the bulletin series.

Additions, Revisions, or New Sections to the Telephone Engineering and Construction Manual. Since the October Newsletter (No. 34) was distributed, the following have been issued:

Add. 1, TE & CM-206, Preparation of an Area Coverage Survey	October 1964
Add. 3, TE & CM-301, Central Office Buildings	October 1964
Add. 3, TE & CM-325, Application Guide for the Preparation of Detail Dial Central Office Equipment Requirements	October 1964
Rev. TE & CM-102, Numerical Index	December 1964
Add. 2, TE & CM-205, Preparation of an Area Coverage Design	December 1964
Rev. TE & CM-319, Inter-Office Trunking and Signaling	December 1964
Rev. TE & CM-445, How to Make Structural Return Loss Measurements	February 1965